

Practice

2. The mean life of iPhone batteries is less than 2 years.

Hypotheses:

$$H_0: \mu \geq 2 \text{ years} \quad H_a: \mu < 2 \text{ years (claim)}$$

Tail direction (explain):

Left-tailed due to H_a being $< 2 \text{ years}$

Potential Errors:

Type I: Conclude that the mean life of iPhone batteries is less than 2 years when it is greater than or equal to two years.

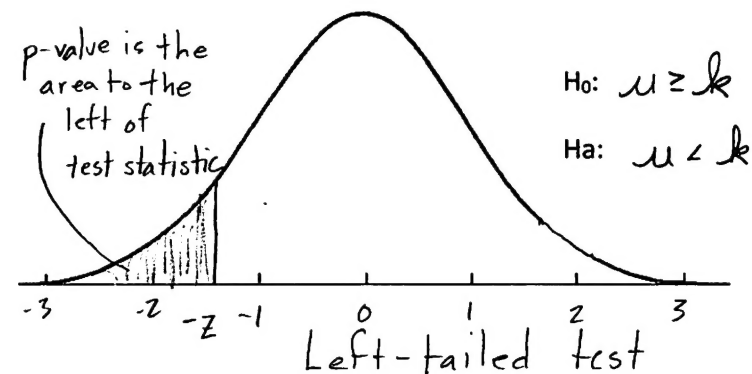
Type II: Conclude that the mean " " is greater than or equal to two years when it is less than 2 years.

7.1 Part 2: Hypothesis Testing

Hypothesis Tests and P-values

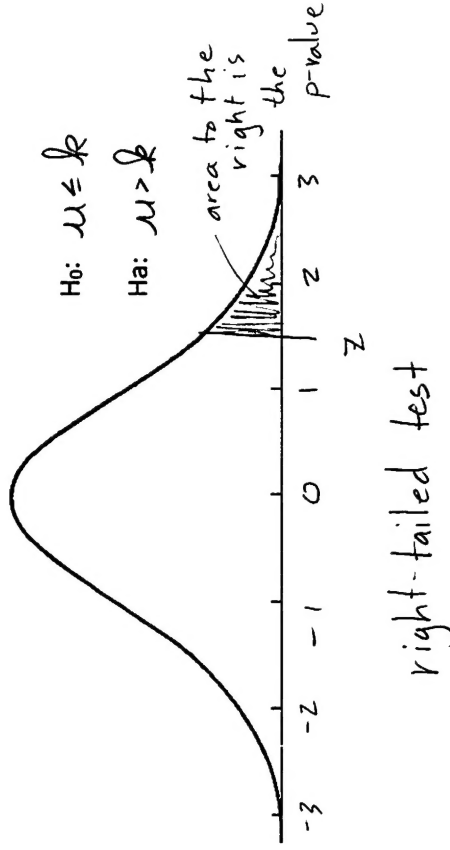
	Population Parameter	Test Statistic	Standardized Test Statistic
Proportions	P	\hat{p}	Z
Means	μ	\bar{x}	$Z (n \geq 30)$ $t (n < 30)$
Variance	σ^2	s^2	χ^2

If your alternative is less than the null hypothesis..

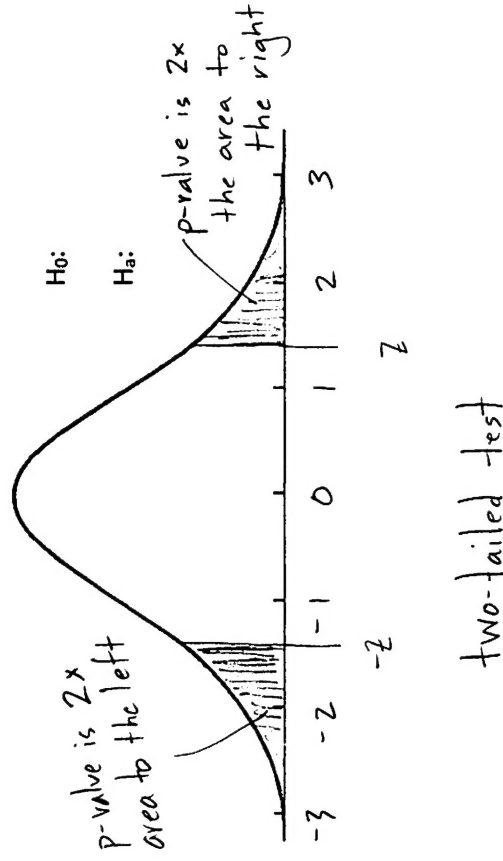


Hypothesis Tests and P-Values

If your alternative is greater than the null hypothesis...



If your alternative is not equal to the null hypothesis...



Practice

State your hypotheses and identify your claim.
Determine if the test is left-tailed, right-tailed, or two-tailed. State your potential type 1 and type 2 errors.

1. Texting while driving The proportion of high school students who text while driving is 78%.

Hypotheses: $H_0: p = .78$ (claim) $H_a: p \neq .78$

Tail direction (explain):

Two-Tailed due to the H_a is \neq

Potential Errors:

Type I: Conclude that the proportion of HS students who text while driving is not 78% when it is.

Type II: Conclude that " " is 78% when it is not.

P-Values

A **small** p-value is considered an **unusual** event. This gives us more evidence to **reject** the H_0 .

7 Steps to Perform a Hypothesis Test

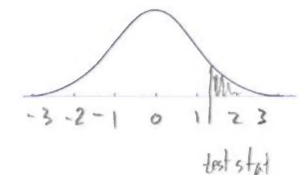
1. State the claim mathematically H_0 :
 H_a :

2. Identify the significance level $\alpha =$

3. Sketch the standardized distribution



4. Calculate the test-statistic and mark it on your standardized distribution



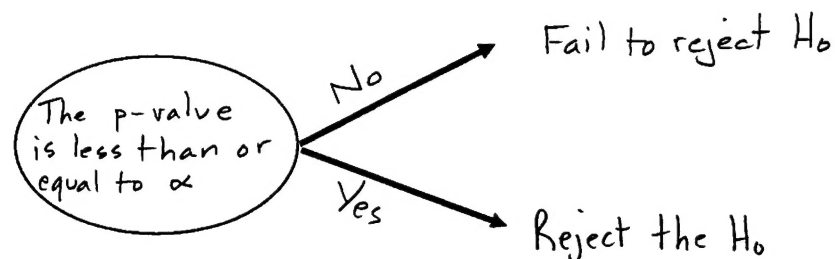
Angela Hogan
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Steps for Hypothesis Tests

5. Calculate p-value

use tables or
technology
normalcdf (z)
t-cdf (t)
standard normal table
t-table

6. Make a decision



7. Interpret your decision in the context of the claim

Practice

3. The proportion of teens that make more than \$8.50 an hour is less than 29%.

Hypotheses:

$H_0: p \geq .29$ $H_a: p < .29$ (claim)

Tail direction (explain):

left-tailed due to H_a being $<$

Potential Errors:

Type 1: Concluding that the proportion of teens who make more than \$8.50 is less than 29% when it is greater than or equal to 29%.

Type 2: Concluding that " " " is greater than or equal to 29% when it is less than 29%.